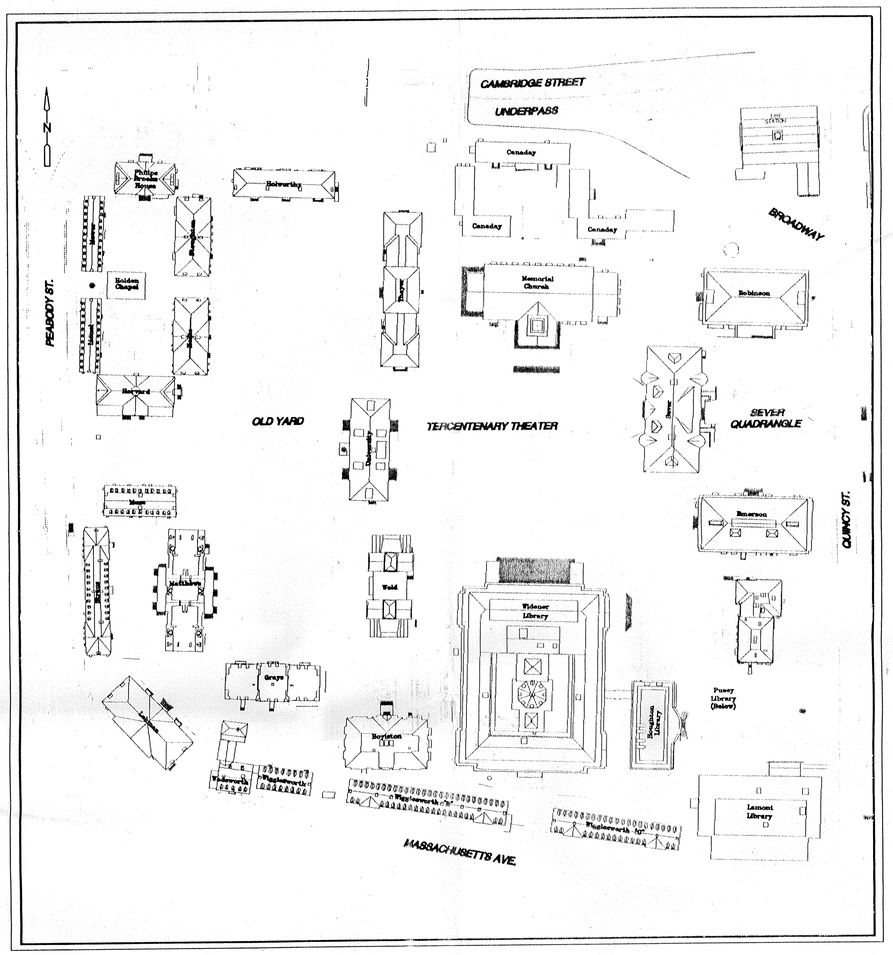
HARVARD UNIVERSITY

UNIVERSITY OPERATIONS SERVICES
ENGINEERING & UTILITIES

EMERSON/ROBINSON STORM DRAINS



LOCATION PLAN

LIST OF DRAWINGS

SHEET NO.	TITLE
GP	GENERAL PLAN
LGN	LEGEND AND GENERAL NOTES
CSP	CONSTRUCTION SEQUENCING PLAN
1	STORM DRAIN PLAN AND PROFILE I
2	STORM DRAIN PLAN AND PROFILE II
3	MISCELLANEOUS DETAILS I
4	MISCELLANEOUS DETAILS II

MAY 1998

AS - BUILT DRAWINGS

COMMONWEALTH OF MASSACHUSETTS
MATTHEW J. EASTWOOD
CIVIL
No. 37174
REGISTERED PROFESSIONAL ENGINEER
11.23.98

CAMP DRESSER & McKEE INC. · CONSULTING ENGINEERS · CAMBRIDGE, MASSACHUSETTS

5/14/98

SEVERCVR.dwg

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LEGEND

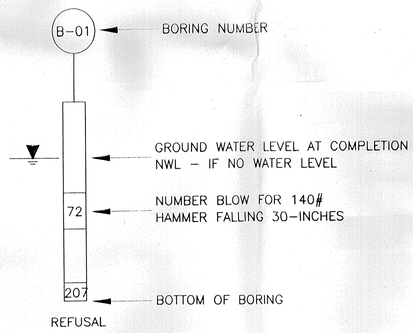
27.7 ×	SPOT ELEVATION
x—x—x	ORDINATE CAST IRON FENCE WITH GRANITE BLOCK FOUNDATION AND BRICK COLUMNS
	GUARD RAIL
	WOOD FENCE
℄	PROPERTY LINE (℄)
	LIMITS OF WORK
B-03 (OW)	EXISTING OBSERVATION WELL
B-05	BORING
TP	TEST PIT
	EXISTING SHRUB
	EXISTING HEDGE
	EXISTING PLANTING
	EXISTING TREE
N 296180 E 759500	COORDINATE LOCATION

1+25	NEW DRAIN AND MANHOLE WITH STATION
	NEW DRAIN SEE OTHER SHEET
CS	EXISTING COMBINED SEWER
SD	EXISTING DRAIN, MANHOLE, AND CATCH BASIN
SS	EXISTING SANITARY SEWER AND MANHOLE
W	EXISTING WATER MAIN WITH HYDRANT AND GATE VALVE
CW	EXISTING CHILLED WATER
E	EXISTING ELECTRICAL VAULT AND DUCT
ST	EXISTING STEAM TUNNEL/STEAM LINE
T	EXISTING TELEPHONE
G	EXISTING GAS
UP	UTILITY POLE
	ELECTRIC LAMP POST
Sign	SIGN POST
	BUILDING FOOTPRINT
N	NORTH ARROW
	GRANITE CURBING
	PAVED FOOTPATH OR ROADWAY

ABBREVIATIONS

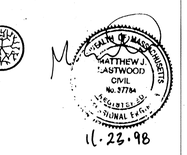
C.I.	CAST IRON	B'FLY VALVE	BUTTERFLY VALVE
C.B.	CATCH BASIN	G.V.	GATE VALVE
C.L.D.I.	CEMENT LINED DUTILE IRON	NGVD	NATIONAL GEODETIC VERTICAL DATUM
D.I.	DUCTILE IRON	PCC	PRESTRESSED CONCRETE CYLINDER
R.C.	REINFORCED CONCRETE	HYD	HYDRANT
P.V.C.	POLYVINYL CHLORIDE	FL	FLOOR
C.M.P.	CORRUGATED METAL PIPE	TS&V	TAPPING SLEEVE AND VALVE
A.C.	ASBESTOS CEMENT	M.H	MANHOLE
INV. EL.	INVERT ELEVATION		

BORING LOG (TYP.)



GENERAL NOTES

1. PLANS AND TOPOGRAPHY PREPARED FROM AERIAL PHOTOGRAMETRY PREPARED FOR HARVARD UNIVERSITY BY BSC, INC., BOSTON, MA IN 1993. HORIZONTAL DATUM IS NORTH AMERICAN DATUM 1983. VERTICAL DATUM IS NORTH AMERICAN DATUM 1929. ELEVATIONS OF GRAVITY UTILITIES WERE OBTAINED IN NOVEMBER 1993 BY ANEPTEK INC., NATICK, MA.
2. ALL ELEVATIONS REFER TO NORTH AMERICAN VERTICAL DATUM 1929.
3. LOCATIONS OF ALL UTILITIES AND SUB-SURFACE STRUCTURES WERE FROM FIELD SURVEYS CONDUCTED BY THE HARVARD PLANNING GROUP IN 1993 AND FROM RECORDS OF UNIVERSITY UTILITIES, AND WERE CONSIDERED APPROXIMATE BOTH AS TO SIZE, MATERIAL AND LOCATION. CONTRACTOR WAS ADVISED THAT UTILITIES SHOWN ON DRAWINGS WERE INCOMPLETE REQUIRING PRE-EXCAVATION FOR UTILITY LOCATION AND IDENTIFICATION IN ACCORDANCE WITH THE SPECIFICATIONS.
4. BORINGS WERE TAKEN UNDER THE DIRECTION OF CAMP DRESSER & McKEE INC., CAMBIDGE, MA. BY JOHN BOYLE DRILLING, MILTON, MA. APPROXIMATE LOCATIONS WERE SHOWN ON THE PLANS. BORING LOGS WERE APPENDED TO THE SPECIFICATION.
5. NOTES PERTAINING TO NEW WORK WERE SHOWN THUS: NEW NOTE
6. THE EXACT LOCATION OF NEW PIPES, MANHOLES, ETC. WERE DETERMINED IN THE FIELD BY ENGINNER.
7. THE CONTRACTOR DID EXERCISE EXTREME CAUTION TO PREVENT DAMAGE TO ADJACENT TREES AND LANDSCAPPING. EROSION AND SEDIMENTATION CONTROL WAS REQUIRED AND WAS STRICTLY ENFORCED.
8. DAILY CLEANUP WAS REQUIRED ALONG ALL WORK AREAS IN HARVARD YARD. CONTRACTOR WAS REQUIRED TO BACKFILL TRENCHES OR COVER WITH STEEL PLATES, FENCE WORK AREAS AND REMOVE ALL RUBBER TIRED EQUIPMENT FROM HARVARD YARD DURING NON WORKING HOURS.
9. CONTRACTOR WAS ADVISED THAT THE IRRIGATION SYSTEM LOCATED IN HARVARD YARD WAS NOT SHOWN ON THE DRAWINGS. ALL SPRINKLER HEADS AND PIPING DAMAGED DURING CONSTRUCTION WAS REPAIRED AT CONTRACTOR'S EXPENSE.
10. CONTRACTOR DID DETERMINE SIZE, LOCATION AND MATERIAL OF EXISTING UTILITIES PRIOR TO CONST.
11. CONTRACTOR CONFIRMED LOCATIONS, SIZES, MATERIALS AND ELEVATIONS OF EXISTING GRAVITY BUILDING SERVICES PRIOR TO CONSTRUCTION.
12. THE EXISTING WROUGHT IRON PERIMETER FENCE AROUND HARVARD YARD REPRESENTED THE OWNER'S PROPERTY LINE BOUNDRY.
13. CONTRACTOR DID EXERCISE EXTREME CAUTION TO PREVENT DAMAGE TO EXISTING BUILDINGS FENCES AND MONUMENTS.
14. NEW PRECAST MANHOLES WERE 5-FOOT DIAMETER FOR RC STORM DRAINS UNLESS IDENTIFIED OTHERWISE ON THE DRAWINGS.
15. CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING FINAL PAVEMENT FOR TWO YEARS. EXISTING BRICK EDGING ALONG WALKWAYS WILL BE REPLACED BY OWNER.
16. THE CHILLED WATER SYSTEM REPRESENTED A 2 PIPE SYSTEM (INSTALLED IN PAIRS OF PARALLEL PIPES), CONSTRUCTED MAINLY OF ASBESTOS CEMENT PIPE. ONE OF THE PAIRS WAS ENCASED IN AN ENCAPSULATING INSULATION WRAP. EXCAVATION BELOW AC PIPE WAS BACKFILLED WITH FLOWABLE FILL AS SPECIFIED.
17. CONTRACTOR DID MAINTAIN PEDESTRIAN ACCESS TO PATHWAYS AND BUILDINGS AND VEHICULAR ACCESS ON UNIVERSITY DRIVES AT ALL TIMES.
18. CONTRACTOR PROVIDED TEMPORARY REPAIRS TO PAVEMENT AND LAWN AREAS WITHIN ONE WEEK FOLLOWING PIPE INSTALLATION. PERMANENT REPAIRS WILL BE MADE BY OWNER.
19. CONTRACTOR WAS ADVISED THAT EXISTING LIGHTING CONDUITS WERE NOT SHOWN ON THE DRAWINGS. ALL CONDUIT DAMAGED DURING CONSTRUCTION WERE REPAIRED AT THE CONTRACTOR'S EXPENSE.
20. CONTRACTOR WAS ADVISED THAT EXISITNG SEWER AND STORM DRAIN SYSTEMS WERE BE MAINTAINED IN FULLY FUNCTIONAL ORDER AT ALL TIMES.
21. WORK WAS PERFORMED TO PROTECT ALL EXISTING STRUCTURES FROM DAMAGE OR DETERIORATION DUE TO CONSTRUCTION OPERATIONS. THE CONTRACTOR WAS RESPONSIBLE FOR ALL MEASURES NECESSARY TO PROVIDE SUCH PROTECTION.
22. NO EXCAVATION WAS PERFORMED WITHIN THE ZONE OF INFLUENCE OF AN EXISTING FOOTING. THIS ZONE WAS DEFINED AS THE AREA BELOW A 1 VERTICAL TO 1 HORIZONTAL LINE EXTENDED DOWNWARD AND OUTWA FROM THE BOTTOM EDGE OF A FOOTING.
23. TREES REQUIRING PROTECTION UNDER SECTION 02900 ARE SHOWN THUS:



11.23.98

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	11/98	MT	MJE	REVISED FOR RECORD DRAWINGS

DESIGNED BY: M. EASTWOOD
DRAWN BY: M. EASTWOOD
SHEET CHK'D BY: M. EASTWOOD
CROSS CHK'D BY: P. HUGHES
APPROVED BY: P. HUGHES
DATE: MAY 1998

CAMP DRESSER & McKEE INC.
environmental engineers, scientists, planners, & management consultants
CDM

HARVARD UNIVERSITY
ENGINEERING & UTILITIES DEPARTMENT

EMERSON/ROBINSON STORM DRAINS

LEGEND AND GENERAL NOTES

PROJECT NO. 0070-10008
FILE NAME: SEVERLGN

SHEET NO.
LGN

0070-XXXXX

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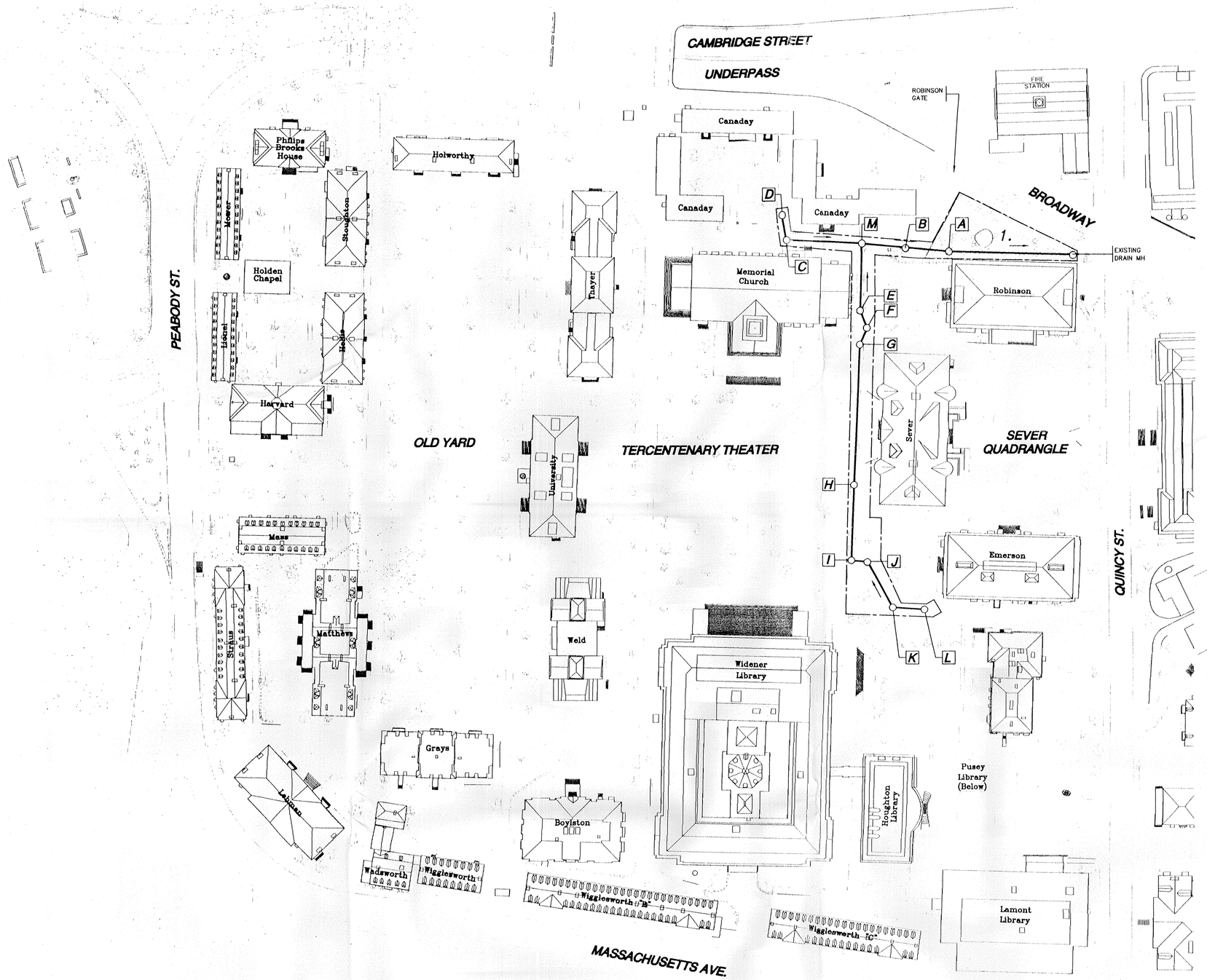

SCALE: 1"=60'

60 0 60

SCALE IN FEET

SEQUENCING PLAN LEGEND

- PROPOSED STORM DRAIN (INSTALLED VIA OPEN-CUT)
- LIMITS OF CONSTRUCTION
- C — PROPOSED MANHOLE IDENTIFIER
- PROPOSED CONSTRUCTION LAYDOWN AREA

SEPARATION CONSTRUCTION SEQUENCE & RESTRICTIONS

1. PROPOSED CONSTRUCTION LAYDOWN AREA SHOWN THUS: 1.
2. NO WORK WAS PERMITTED PRIOR TO JUNE 8, 1998.
3. ALL WORK WAS COMPLETED BY AUGUST 1998.
4. CONTRACTOR'S OPERATIONS WERE RESTRICTED TO THE LIMITS OF WORK IDENTIFIED ON THE DRAWINGS. NO EXCEPTIONS WERE MADE.
5. LAYDOWN AREA WAS ENCLOSED WITH A PERMANENT 8-FOOT SCREENED CHAIN LINK FENCE AS SPECIFIED.
6. ALL OPEN TRENCHES (INCLUDING THE EXCAVATOR) WERE FENCED WITH 8-FOOT PORTABLE CHAIN LINK FENCING DURING NON-WORKING HOURS. DURING WORKING HOURS ALL TRENCHES WERE ADEQUATELY PROTECTED (E.G. FENCING AND SIGNAGE) TO ENSURE SAFETY OF THE PUBLIC.
7. CONSTRUCTION WORK WAS PERMITTED BETWEEN THE HOURS OF 8 AM AND 6 PM. WORK WAS PERMITTED MONDAY THROUGH FRIDAY IN JUNE. DURING JULY AND AUGUST, SATURDAY WORK WAS PERMITTED.
8. CONTRACTOR WAS ADVISED THAT SUMMER SCHOOL WAS IN SESSION BETWEEN JUNE 20TH AND AUGUST 7TH. SEVER HALL, ROBINSON HALL, EMERSON HALL, AND CANADAY HALL WERE IN USE DURING THIS PERIOD.
9. THE CONTRACTOR WAS ADVISED THAT ONLY ONE EAST-WEST WALKWAY IN HARVARD YARD WAS ALLOWED TO BE CLOSED AT ANY GIVEN TIME.
10. THE CONTRACTOR WAS ADVISED THAT THE ROBINSON GATE IS THE MAIN EMERGENCY ACCESS TO HARVARD YARD. EMERGENCY ACCESS WAS MAINTAINED THROUGH THIS GATE DURING NON-WORKING HOURS AT ALL TIMES.
11. THE MAIN ROBINSON GATE DRIVEWAY WAS PLATED OVER DURING NON-WORKING HOURS.
12. THE OWNER WAS REQUIRED A SMALL ACCESSABLE PORTION OF THE LAYDOWN AREA FOR EQUIPMENT STORAGE AT ALL TIMES.
13. THE CONTRACTOR WAS ALLOWED TO UTILIZE UP TO TWO CONSTRUCTION CREWS AT A TIME.
14. ALL RUBBER TIRED EQUIPMENT WAS REMOVED FROM THE SITE OR STORED IN THE LAYDOWN AREA DURING NON-WORKING HOURS.
15. A PORTABLE FIELD OFFICE WAS REQUIRED. THE FIELD OFFICE WAS LOCATED IN THE LAYDOWN AREA.
16. THE WORK WAS CONDUCTED IN THE FOLLOWING SEQUENCE:
    - A. ALL TEST PITS WERE PERFORMED BEFORE TRENCHING BEGAN.
    - B. CONSTRUCTION FROM MH G TO MH H (COMPLETED BY JUNE 19TH).
    - C. CONSTRUCTION FROM MH K TO MH JL (COMPLETED BY JUNE 19TH).
    - D. CONSTRUCTION FROM MH H TO MH K.
    - E. CONSTRUCTION FROM MH M TO MH G.
    - F. CONSTRUCTION FROM MH B TO MH C.
    - G. CONSTRUCTION FROM EXISTING DRAIN MH AND MH B.
    - H. ALL STORM DRAIN CONNECTIONS TO THE NEW SYSTEM.
17. THE CONTRACTOR DID PROVIDE AN ALTERNATE BID PRICE TO COMPLETE CONSTRUCTION FROM MH B TO MH C BEFORE JUNE 19TH.
18. BRACED EXCAVATION WAS REQUIRED AS SHOWN ON THE DRAWINGS IN AN EFFORT TO SIGNIFICANTLY MINIMIZE TRENCH WIDTH AT THESE LOCATIONS.

COMMONWEALTH OF MASSACHUSETTS
MATTHEW J. EASTWOOD
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No. 37754
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11.22.98

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CDM

HARVARD UNIVERSITY
ENGINEERING AND UTILITIES DEPARTMENT

EMERSON/ROBINSON STORM DRAINS

CONSTRUCTION SEQUENCING PLAN

PROJECT NO. 0070-0008
FILE NAME: SEVERCSP

SHEET NO.
CSP

0070-XXXXX

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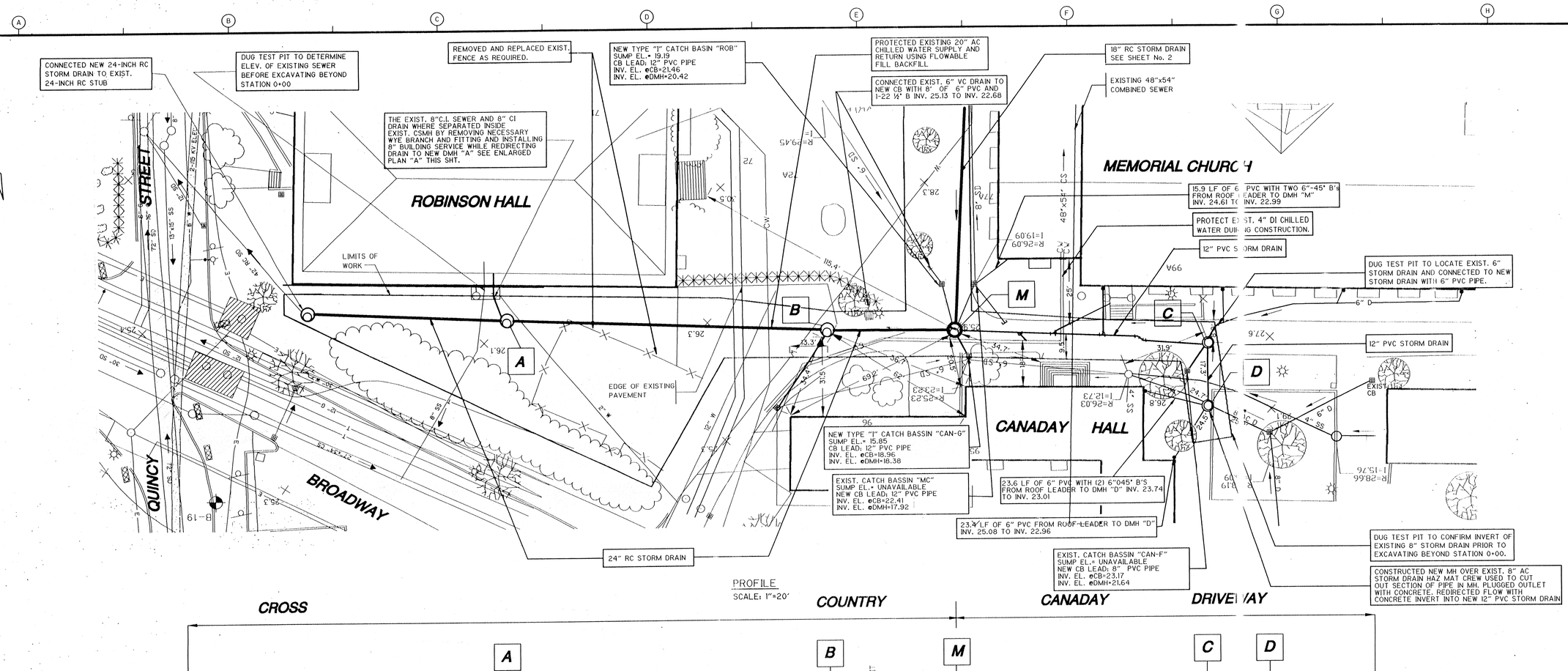
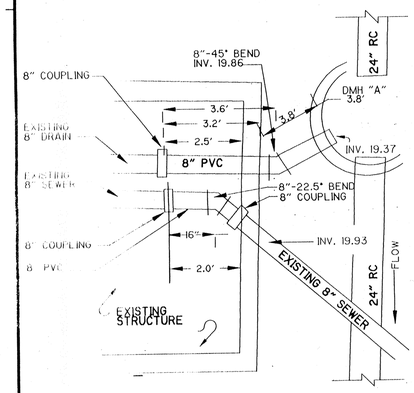

CONNECTED NEW 24-INCH RC STORM DRAIN TO EXIST. 24-INCH RC STUB
DUG TEST PIT TO DETERMINE ELEV. OF EXISTING SEWER BEFORE EXCAVATING BEYOND STATION 0+00
REMOVED AND REPLACED EXIST. FENCE AS REQUIRED.
NEW TYPE "I" CATCH BASIN "ROB" SUMP EL.= 19.19 CB LEAD: 12" PVC PIPE INV. EL. ⊕CB=21.46 INV. EL. ⊕DMH=20.42
PROTECTED EXISTING 20" AC CHILLED WATER SUPPLY AND RETURN USING FLOWABLE FILL BACKFILL
CONNECTED EXIST. 6" VC DRAIN TO NEW CB WITH 8" OF 6" PVC AND 1-22 ½° B INV. 25.13 TO INV. 22.68
18" RC STORM DRAIN SEE SHEET No. 2
EXISTING 48"x54" COMBINED SEWER
THE EXIST. 8"C.I. SEWER AND 8" CI DRAIN WHERE SEPARATED INSIDE EXIST. CSMH BY REMOVING NECESSARY WYE BRANCH AND FITTING AND INSTALLING 8" BUILDING SERVICE WHILE REDIRECTING DRAIN TO NEW DMH "A" SEE ENLARGED PLAN "A" THIS SHT.
ROBINSON HALL
MEMORIAL CHURCH
15.9 LF OF 6" PVC WITH TWO 6"-45° B's FROM ROOF LEADER TO DMH "M" INV. 24.61 TO INV. 22.99
PROTECT EXIST. 4" DI CHILLED WATER DUCT DURING CONSTRUCTION.
12" PVC STORM DRAIN
DUG TEST PIT TO LOCATE EXIST. 6" STORM DRAIN AND CONNECTED TO NEW STORM DRAIN WITH 6" PVC PIPE.
12" PVC STORM DRAIN
LIMITS OF WORK
EDGE OF EXISTING PAVEMENT
CANADAY HALL
NEW TYPE "I" CATCH BASSIN "CAN-G" SUMP EL.= 15.85 CB LEAD: 12" PVC PIPE INV. EL. ⊕CB=18.96 INV. EL. ⊕DMH=18.38
EXIST. CATCH BASSIN "MC" SUMP EL.= UNAVAILABLE NEW CB LEAD: 12" PVC PIPE INV. EL. ⊕CB=22.41 INV. EL. ⊕DMH=17.92
23.6 LF OF 6" PVC WITH (2) 6"045° B'S FROM ROOF LEADER TO DMH "D" INV. 23.74 TO INV. 23.01
23.4 LF OF 6" PVC FROM ROOF LEADER TO DMH "D" INV. 25.08 TO INV. 22.96
EXIST. CATCH BASSIN "CAN-F" SUMP EL.= UNAVAILABLE NEW CB LEAD: 8" PVC PIPE INV. EL. ⊕CB=23.17 INV. EL. ⊕DMH=21.64
DUG TEST PIT TO CONFIRM INVERT OF EXISTING 8" STORM DRAIN PRIOR TO EXCAVATING BEYOND STATION 0+00.
CONSTRUCTED NEW MH OVER EXIST. 8" AC STORM DRAIN HAZ MAT CREW USED TO CUT OUT SECTION OF PIPE IN MH. PLUGGED OUTLET WITH CONCRETE. REDIRECTED FLOW WITH CONCRETE INVERT INTO NEW 12" PVC STORM DRAIN
24" RC STORM DRAIN
QUINCY STREET
BROADWAY
COUNTRY
CANADAY
DRIVEWAY
CROSS
PROFILE
SCALE: 1"=20'
A
B
M
C
D
EXISTING GROUND SURFACE
4-FT DIAMETER MH
NEW 8" PVC STORM DRAIN FROM ROBINSON HALL INV. 19.37
FLOWABLE CONCRETE FILL PLACED TO SUPPORT TWIN 20" AC CHILLED WATER MAINS
12" PVC DRAIN FROM CB. "ROB" INV. 20.42
12" PVC DRAIN FROM CB "MC" INV. 17.92
8" PVC DRAIN FROM CB "C" INV. 21.64
24" STORM DRAIN S=0.0021
24" STORM DRAIN S=0.0018
24" RC STORM DRAIN S=0.0033
12" PVC STORM DRAIN S=0.0053
18" RC STORM DRAIN INVERT EL. = 15.21 SEE SHEET No. 2
INSTALLED CONCRETE ENCASEMENT TO PROTECT EXISTING 4"SS
EXISTING 8" AC STORM DRAIN INV. 15.44
12" PVC STORM DRAIN S=0.007
EXISTING CONCRETE MANHOLE STRUCTURE
EXISTING 42-INCH STORM DRAIN
ELEVATION
0+00
0+75.1
1+98.1
2+45.95 = 0+00 SHEET No. 2
3+41.78
3+66.03
75.10
123.00
47.85
95.83
INV. 13.20 ± INV. 13.30
INV. 13.46 INV. 13.50
INV. 13.72 INV. 13.74-13.25
INV. 13.90 INV 14.53
INV. 15.04 INV. 15.13
INV. 15.30
12"X6" WYE/2.7° CHIM STA. 2+69.98
6" CANADAY DRAIN 12"X8" WYE/7.1° CHIM STA. 2+82.28
8" MEM. CHURCH DRAIN
12"X6" WYE/3.0° CHIM STA. 3+01.18
8" MEM. CHURCH DRAIN
12"-22½° BEND STA. 3+23.28
12"-22½° BEND STA. 3+26.78



ENLARGED PLAN " A "
NTS

NOTES:
1. CONTRACTOR TO PROTECT EXISTING ROBINSON HALL STONE BUILDING FOUNDATION. SEE GENERAL NOTES 22 AND 23.

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1	11/98	MT	MJE	REVISED FOR RECORD DRAWINGS

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DRAWN BY: M. EASTWOOD
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APPROVED BY: P. HUGHES
DATE: MAY 98

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HARVARD UNIVERSITY
ENGINEERING & UTILITIES DEPARTMENT

EMERSON/ROBINSON STORM DRAINS

STORM DRAIN PLAN AND PROFILE I

PROJECT NO. 0070-010-DN
FILE NAME: SEVER_01
SHEET NO. 1
0070-XXXXX

COMMONWEALTH OF MASSACHUSETTS MATTHEW J. EASTWOOD CIVIL No. 37784 REGISTERED PROFESSIONAL ENGINEER
11.25.98

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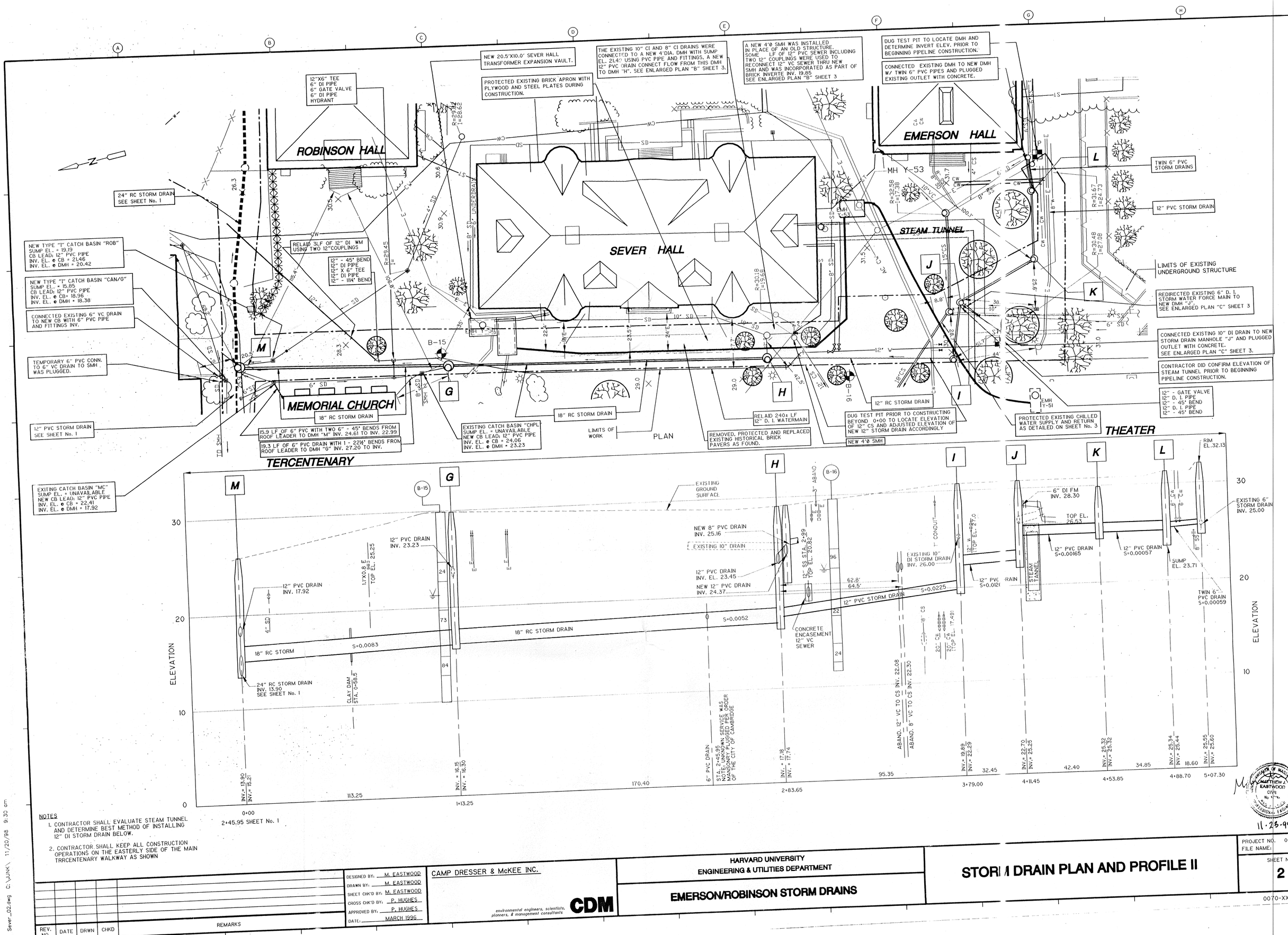

ROBINSON HALL
SEVER HALL
EMERSON HALL
MEMORIAL CHURCH
STEAM TUNNEL
THEATER
TERCENTENARY
PLAN
ELEVATION
NEW 20.5'X10.0' SEVER HALL TRANSFORMER EXPANSION VAULT.
PROTECTED EXISTING BRICK APRON WITH PLYWOOD AND STEEL PLATES DURING CONSTRUCTION.
THE EXISTING 10" CI AND 8" CI DRAINS WERE CONNECTED TO A NEW 4'DIA. DMH WITH SUMP EL. 21.4± USING PVC PIPE AND FITTINGS. A NEW 12" PVC DRAIN CONNECT FLOW FROM THIS DMH TO DMH "H". SEE ENLARGED PLAN "B" SHEET 3.
A NEW 4'Ø SMH WAS INSTALLED IN PLACE OF AN OLD STRUCTURE. SOME LF OF 12" PVC SEWER INCLUDING TWO 12" COUPLINGS WERE USED TO RECONNECT 12" VC SEWER THRU NEW SMH AND WAS INCORPORATED AS PART OF BRICK INVERTE INV. 19.85 SEE ENLARGED PLAN "B" SHEET 3
DUG TEST PIT TO LOCATE DMH AND DETERMINE INVERT ELEV. PRIOR TO BEGINNING PIPELINE CONSTRUCTION.
CONNECTED EXISTING DMH TO NEW DMH W/ TWIN 6" PVC PIPES AND PLUGGED EXISTING OUTLET WITH CONCRETE.
12"X6" TEE
6" DI PIPE
6" GATE VALVE
6" DI PIPE
HYDRANT
24" RC STORM DRAIN SEE SHEET No. 1
NEW TYPE "I" CATCH BASIN "ROB"
SUMP EL. = 19.19
CB LEAD: 12" PVC PIPE
INV. EL. @ CB = 21.46
INV. EL. @ DMH = 20.42
NEW TYPE "I" CATCH BASIN "CAN/G"
SUMP EL. = 15.85
CB LEAD: 12" PVC PIPE
INV. EL. @ CB= 18.96
INV. EL. @ DMH = 18.38
CONNECTED EXISTING 6" VC DRAIN TO NEW CB WITH 6" PVC PIPE AND FITTINGS INV.
TEMPORARY 6" PVC CONN. TO 6" VC DRAIN TO SMH . WAS PLUGGED.
12" PVC STORM DRAIN SEE SHEET No. 1
EXITING CATCH BASIN "MC"
SUMP EL. = UNAVAILABLE
NEW CB LEAD: 12" PVC PIPE
INV. EL. @ CB = 22.41
INV. EL. @ DMH = 17.92
RELAID 3LF OF 12" DI WM USING TWO 12"COUPLINGS
12" - 45° BEND
12" DI PIPE
12" X 6" TEE
12" DI PIPE
12" - 11¼° BEND
15.9 LF OF 6" PVC WITH TWO 6" - 45° BENDS FROM ROOF LEADER TO DMH "M" INV. 24.61 TO INV. 22.99
19.3 LF OF 6" PVC DRAIN WITH 1 - 22½° BENDS FROM ROOF LEADER TO DMH "G" INV. 27.20 TO INV.
18" RC STORM DRAIN
EXISTING CATCH BASIN "CHPL"
SUMP EL. = UNAVAILABLE
NEW CB LEAD: 12" PVC PIPE
INV. EL. @ CB = 24.06
INV. EL. @ DMH = 23.23
LIMITS OF WORK
REMOVED, PROTECTED AND REPLACED EXISTING HISTORICAL BRICK PAVERS AS FOUND.
RELAID 240± LF 12" D. I. WATERMAIN
DUG TEST PIT PRIOR TO CONSTRUCTING BEYOND 0+00 TO LOCATE ELEVATION OF 12" CS AND ADJUSTED ELEVATION OF NEW 12" STORM DRAIN ACCORDINGLY
NEW 4'Ø SMH
12" RC STORM DRAIN
PROTECTED EXISTING CHILLED WATER SUPPLY AND RETURN AS DETAILED ON SHEET No. 3
TWIN 6" PVC STORM DRAINS
12" PVC STORM DRAIN
LIMITS OF EXISTING UNDERGROUND STRUCTURE
REDIRECTED EXISTING 6" D. I. STORM WATER FORCE MAIN TO NEW DMH "J". SEE ENLARGED PLAN "C" SHEET 3
CONNECTED EXISTING 10" DI DRAIN TO NEW STORM DRAIN MANHOLE "J" AND PLUGGED OUTLET WITH CONCRETE. SEE ENLARGED PLAN "C" SHEET 3.
CONTRACTOR DID CONFIRM ELEVATION OF STEAM TUNNEL PRIOR TO BEGINNING PIPELINE CONSTRUCTION.
12" - GATE VALVE
12" D. I. PIPE
12" - 45° BEND
12" D. I. PIPE
12" - 45° BEND
EXISTING GROUND SURFACE
12" PVC DRAIN INV. 23.23
1.1'X0.8' E TOP EL. 25.25
12" PVC DRAIN INV. 17.92
4" SD
18" RC STORM
S=0.0083
24" RC STORM DRAIN INV. 13.90 SEE SHEET No. 1
CLAY DAM STA. 0+58.5
INV. = 13.90 INV.= 16.21
INV. = 16.15 INV. = 16.30
113.25
0+00
2+45.95 SHEET No. 1
18" RC STORM DRAIN
S=0.0052
6" PVC DRAIN
STA. 2+45.95
UNKNOWN SERVICE WAS FOUND PLUGGED PER ORDER OF THE CITY OF CAMBRIDGE
170.40
1+13.25
NEW 8" PVC DRAIN INV. 25.16
EXISTING 10" DRAIN
12" PVC DRAIN INV. EL. 23.45
NEW 12" PVC DRAIN INV. 24.37
12" SS STA. 2+99 TOP EL. 20.82
CONCRETE ENCASEMENT 12" VC SEWER
INV. = 17.18 INV. = 17.74
62.8'
64.5'
12" PVC STORM DRAIN
S=0.0225
EXISTING 10" DI STORM DRAIN INV. 26.00
ABAND. 12" VC TO CS INV. 22.08
ABAND. 8" VC TO CS INV. 22.30
95.35
2+83.65
INV.= 18.89
INV.= 22.29
32.45
3+79.00
INV.= 22.70
INV.= 25.25
42.40
4+11.45
INV.= 25.32
INV.= 25.32
34.85
4+53.85
INV.= 25.34
INV.= 25.44
18.60
4+88.70
INV.= 25.55
INV.= 25.60
5+07.30
6" DI FM INV. 28.30
TOP EL. 26.53
12" PVC DRAIN S=0.00165
12" PVC DRAIN S=0.00057
SUMP EL. 23.71
TWIN 6" PVC DRAIN S=0.00059
EXISTING 6" STORM DRAIN INV. 25.00
RIM EL.32.13
STEAM TUNNEL
NOTES
1. CONTRACTOR SHALL EVALUATE STEAM TUNNEL AND DETERMINE BEST METHOD OF INSTALLING 12" DI STORM DRAIN BELOW.
2. CONTRACTOR SHALL KEEP ALL CONSTRUCTION OPERATIONS ON THE EASTERLY SIDE OF THE MAIN TRRCENTENARY WALKWAY AS SHOWN

MATTHEW J. EASTWOOD CIVIL No. 37474 REGISTERED PROFESSIONAL ENGINEER
11·23·98

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: M. EASTWOOD
DRAWN BY: M. EASTWOOD
SHEET CHK'D BY: M. EASTWOOD
CROSS CHK'D BY: P. HUGHES
APPROVED BY: P. HUGHES
DATE: MARCH 1996

CAMP DRESSER & McKEE INC.
environmental engineers, scientists, planners, & management consultants
CDM

HARVARD UNIVERSITY
ENGINEERING & UTILITIES DEPARTMENT

EMERSON/ROBINSON STORM DRAINS

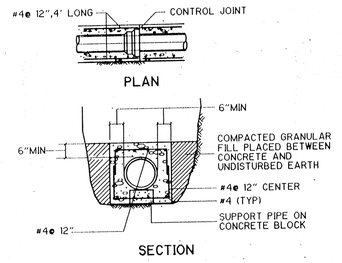
STORM DRAIN PLAN AND PROFILE II

PROJECT NO. 0070-010-DN
FILE NAME: SEVER_02

SHEET NO. 2

0070-XXXXX

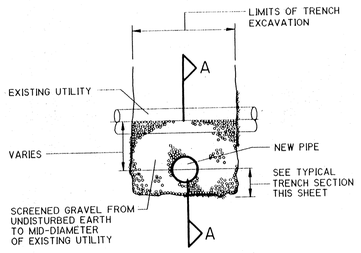
Sever_02.dwg C:\JUNK\ 11/20/98 9.30 am

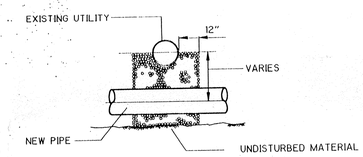


NOTES:

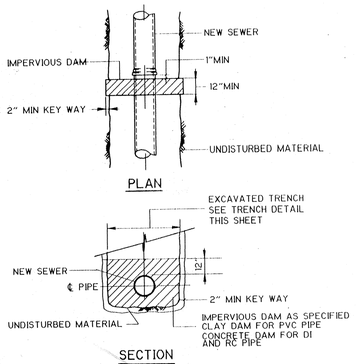
1. CONTROL JOINTS AND PIPE JOINTS FOR ARCHES, AND ENCASEMENT SHALL COINCIDE FOR SPACING. MAX.DISTANCE BETWEEN CONTROL JOINTS SHALL BE 24'±
2. REINFORCING STEEL TO BE USED ONLY WHEN DEPTH OF COVER TO TOP OF SURFACE OF CONCRETE IS 5'-0" OR LESS

CONCRETE PIPE ENCASEMENT DETAIL
NTS

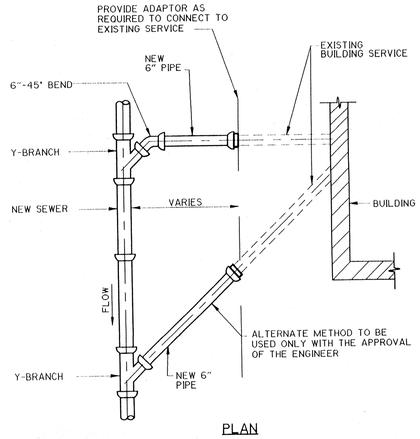


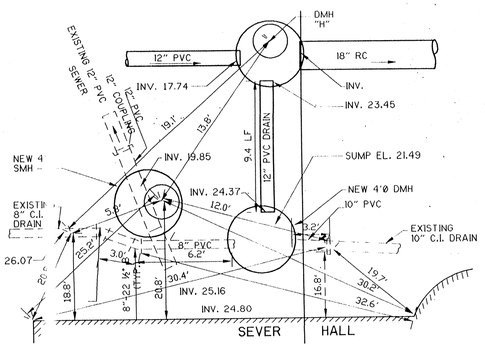


UTILITY CROSSING DETAIL
NTS

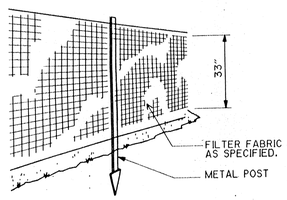


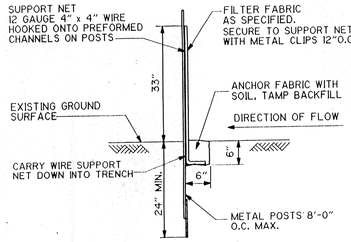
PIPE TRENCH DAM DETAIL
NTS



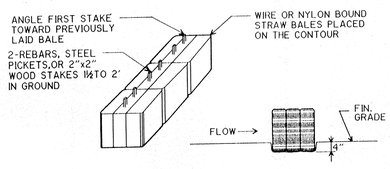


ENLARGED PLAN "B"
NTS

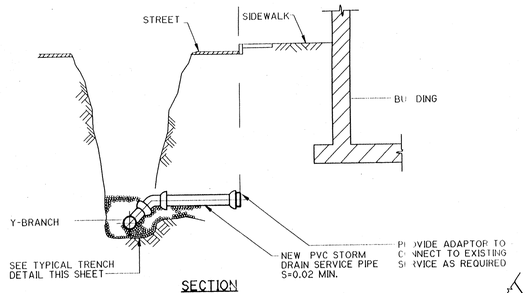



SUPPORT NET 12 GAUGE 4" x 4" WIRE HOOKED ONTO PREFORMED CHANNELS ON POSTS
FILTER FABRIC AS SPECIFIED. SECURE TO SUPPORT NET WITH METAL CLIPS 12"O.C.
ANCHOR FABRIC WITH SOIL, TAMP BACKFILL
DIRECTION OF FLOW
EXISTING GROUND SURFACE
33"
8"
6"
CARRY WIRE SUPPORT NET DOWN INTO TRENCH
24" MIN.
METAL POSTS 8'-0" O.C. MAX.

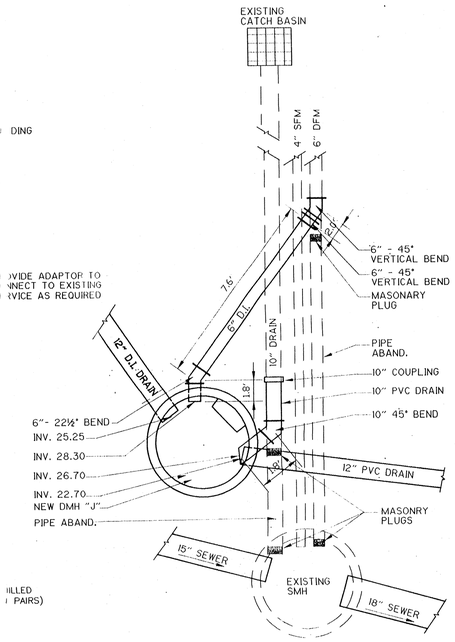
SILT FENCE DETAIL
NTS


ANGLE FIRST STAKE TOWARD PREVIOUSLY LAID BALE
2-REBARS, STEEL PICKETS,OR 2"x2" WOOD STAKES 1½TO 2' IN GROUND
WIRE OR NYLON BOUND STRAW BALES PLACED ON THE CONTOUR
FLOW
FIN. GRADE
4"

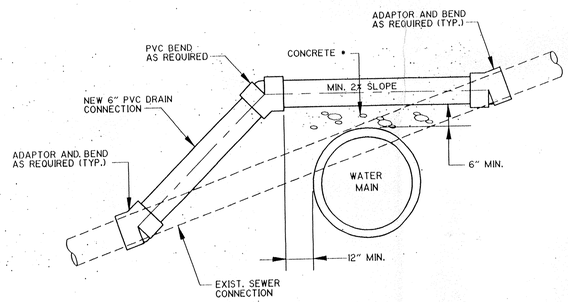
STAKED HAYBALE DETAIL
NTS



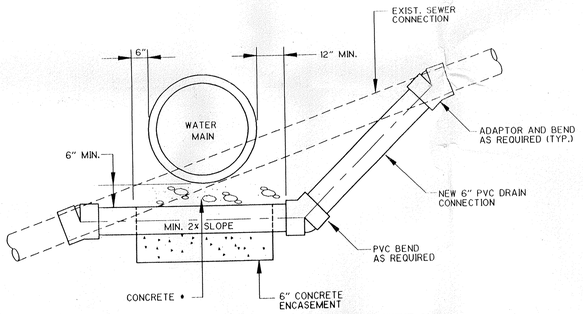
DRAIN SERVICE CONNECTION DETAIL
NTS



ENLARGED PLAN "C"
NTS

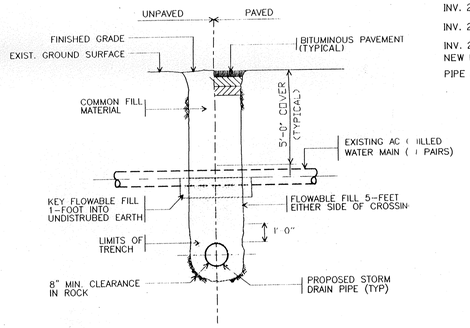


DRAIN RELOCATION ABOVE WATER MAIN
NTS



DRAIN RELOCATION BELOW WATER MAIN
NTS

• CONCRETE ENCASEMENT SHALL BE REQUIRED AROUND SEWER AND WATER MAIN WHERE THE VERTICAL DISTANCE IS LESS THAN 18-IN. ENCASEMENT SHALL EXTEND 10 FEET BEYOND EACH SIDE OF THE CROSSING ALONG THE WATER MAIN.



TYPICAL TRENCH DETAIL FOR CHILLED WATER MAIN CROSSING

NOTE:
1. FLOWABLE FILL TO EXTEND HORIZONTALLY 5-FT BEYOND OUTSIDE OF CHILLED WATER LINE.
2. SIMILAR BACKFILL REQUIREMENTS WILL BE REQUIRED AT STEAM TUNNEL CROSSING.

COMMONWEALTH OF MASSACHUSETTS
MATTHEW J EASTWOOD
CIVIL
No. 37764
REGISTERED PROFESSIONAL ENGINEER
11.23.98

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	11/98	MT	MJE	REVISED FOR RECORD DRAWINGS

DESIGNED BY: M. EASTWOOD
DRAWN BY: M. EASTWOOD
SHEET CHK'D BY: M. EASTWOOD
CROSS CHK'D BY: P. HUGHES
APPROVED BY: P. HUGHES
DATE: MAY 1998

CAMP DRESSER & McKEE INC.
environmental engineers, scientists, planners, & management consultants
CDM

HARVARD UNIVERSITY
ENGINEERING & UTILITIES DEPARTMENT

EMERSON/ROBINSON STORM DRAINS

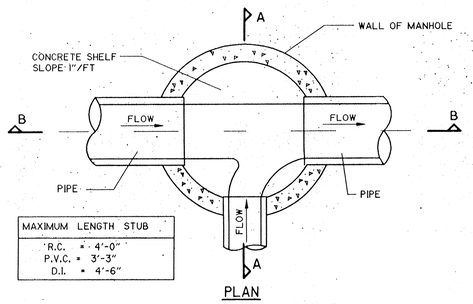
MISCELLANEOUS DETAILS I

PROJECT NO. 0070-10008
FILE NAME: SEVER_03

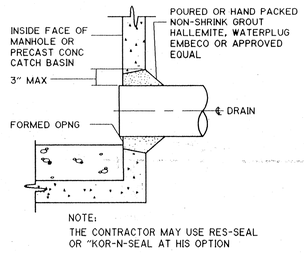
SHEET NO. 3

0070-XXXXX

Sever_03.dwg C:\JUNK\ 11/20/98 8:28 am



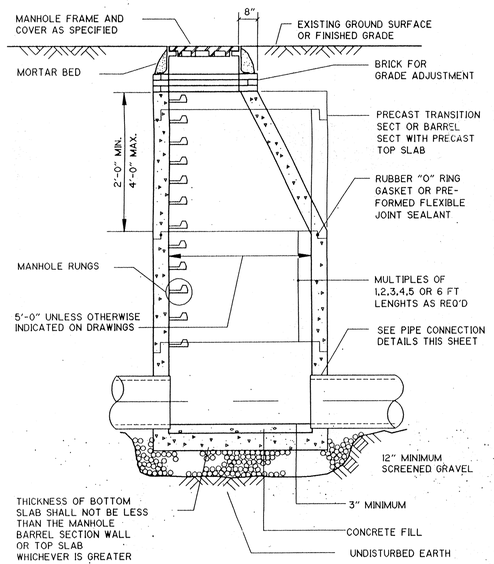
PLAN



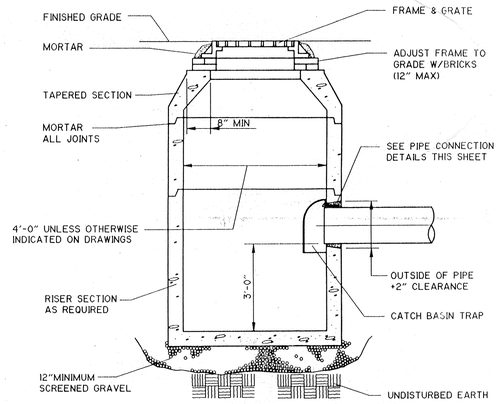
NOTE:
THE CONTRACTOR MAY USE RES-SEAL
OR "KOR-N-SEAL AT HIS OPTION

MH PIPE CONNECTION FOR DRAIN MH AND CATCH BASIN

NTS

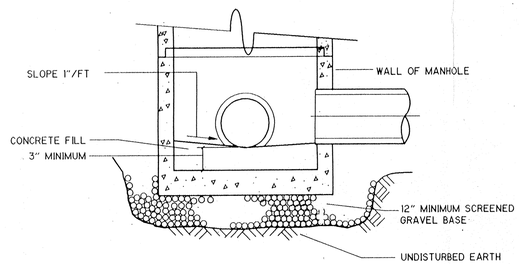


SECTION B-B



PRECAST CATCH BASIN DETAIL

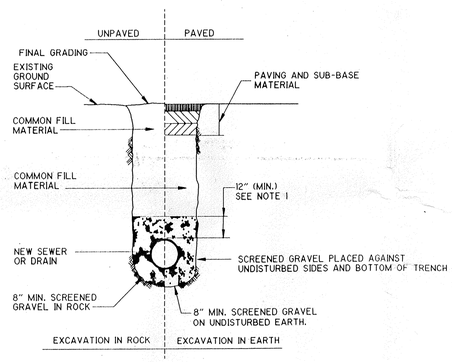
NTS



SECTION A-A

PRECAST DRAIN MANHOLE DETAL

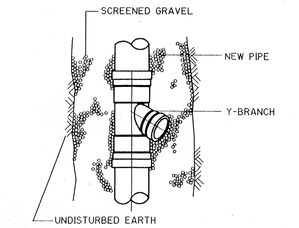
NTS



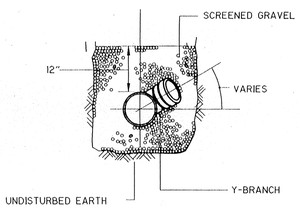
NOTE:
1. FOR PIPES OTHER THAN PVC, SELECTED COMMON FILL MAY BE USED FROM MID DIAMETER OF PIPE TO 12" ABOVE TOP OF PIPE.
2. TRENCHES LOCATED ON THE ROAD SHOULDER SHALL BE TREATED THE SAME AS STREET TRENCHES EXCEPT FOR PAVING.
3. PROVIDE AT LEAST ONE IMPERVIOUS DAM IN GRAVEL BEDDING BETWEEN EACH MANHOLE OR EVERY 300 FT, WHICHEVER IS LESS. SEE DETAIL ON SHEET 3.
4. SHEETING AND BRACING MAY BE EMPLOYED AT THE CONTRACTOR'S OPTION.

TYPICAL TRENCH DETAIL

NTS



PLAN



SECTION

PVC Y-BRANCH

NTS

11.23.98

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: M. EASTWOOD
DRAWN BY: M. EASTWOOD
SHEET CHK'D BY: M. EASTWOOD
CROSS CHK'D BY: P. HUGHES
APPROVED BY: P. HUGHES
DATE: MAY 1998

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HARVARD UNIVERSITY
ENGINEERING & UTILITIES DEPARTMENT

EMERSON/ROBINSON STORM DRAINS

MISCELLANEOUS DETAILS II

PROJECT NO. 0070-10008
FILE NAME: SEVER_04

SHEET NO.
4

0070-XXXXX

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